

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Appellants:	§	Art Unit: 2619
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Timothy Millet	§	Confirmation No.: 1585
Kung-Ling Ko	§	
	§	
Serial No.: 10/699,568	§	Examiner: Frank Duong
	§	
Filed: October 31, 2003	§	Docket No.: 112-0132US
	§	
For: Load Balancing in Core-Edge	§	Customer No.: 29855
Configurations	§	

**APPEAL BRIEF**

***Via USPTO EFS***

**June 6, 2008**

Commissioner for Patents  
P. O. Box 1450  
Alexandria, VA 22313-1450

Appellants hereby submit this Appeal Brief in connection with the above-identified application. A Notice of Appeal was filed on April 11, 2008.

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**I. REAL PARTY IN INTEREST**

The real party in interest is Brocade Communications Systems, Inc.

**II. RELATED APPEALS AND INTERFERENCES**

Appellants are unaware of any related appeals or interferences.

### III. STATUS OF THE CLAIMS

Originally filed claims:	1-157. <sup>1</sup>
Added claims:	None.
Claim cancellations:	4, 5, 7-18, 21-28, 31, 36, 37, 39-50, 53-60, 63, 68, 69, 71-82, 85-92, 96, 100, 101, 103-113, 116-123 and 126-157.
Presently pending claims:	1-3, 6, 19, 20, 29, 30, 32-35, 38, 51, 52, 61, 62, 64-67, 70, 83, 84 <sup>2</sup> 93-95, 97-99, 102, 114, 115, 124 and 125.
Presently appealed claims:	1-3, 6, 19, 20, 29, 30, 32-35, 38, 51, 52, 61, 62, 64-67, 70, 83, 84, 93-95, 97-99, 102, 114, 115, 124 and 125.
Presently allowed claims:	None.
Presently objected claims:	None.

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<sup>1</sup> Appellants respectfully note that 158 claims were actually originally filed, but the claims as originally filed included two claims that were both numbered "103," resulting in claim number 157 being the highest numbered claim in the original application. The error was rendered moot with the cancellation of claims 103-113.

<sup>2</sup> Appellants respectfully note that although claim 84 was never cancelled by any of Appellants' amendments, the claim was erroneously not listed as pending by the Examiner.

#### **IV. STATUS OF THE AMENDMENTS**

Following receipt of the Final Office Action of December 18, 2007 (hereinafter “Final Office Action”), Appellants amended claim 1 to replace two occurrences of the term “them,” with “the frames.” Although confirmation of entry of Appellants’ Amendment after the Final Office Action (hereinafter “Amendment”) was not noted on the Advisory Action of April 1, 2008 (issued in response to the Amendment), the initialed Amendment of record in the Image File Wrapper (accessible through the Patent Application Information Retrieval system) indicates that the Examiner entered the Amendment. Entry of the Amendment was also confirmed by the Examiner in a voicemail message left with Appellants Attorney, Roberto de León, on June 2, 2008.<sup>3</sup>

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<sup>3</sup> The Examiner’s voicemail message was in response to an inquiry made by Appellants’ Attorney, via voicemail, on May 30, 2008. Appellants thank the Examiner for the prompt response (1 working day).

## V. SUMMARY OF THE CLAIMED SUBJECT MATTER

Data communication between devices is frequently facilitated over communication networks (*e.g.*, a switch fabric), which may be implemented according to any of a number of different networking communication standards, including the Fibre Channel family of standards.<sup>4</sup> Fibre Channel switch fabrics, for example, are typically constructed from one or more Fibre Channel compliant switches, and devices coupled to such a switch fabric are capable of communicating with other devices coupled to the fabric.<sup>5</sup> One issue that arises with devices used in such networks, however, is that frame traffic between a source device and a destination device is to be delivered “in-order.”<sup>6</sup> But under at least some circumstances, such “in-order” delivery can result in frame routing that produces congestion and/or delay, as compared to the delivery of frames that would result if the “in-order” delivery constraint were not accommodated.<sup>7</sup> Providing systems and methods for balancing frame traffic across two or more switches within a communication network that couples two or more devices to each other, while maintaining “in-order” delivery of the frames, is the subject of Appellants’ technological contribution.

In accordance with the invention of independent claim 1, for example, a method is described for routing a flow of frames for a core-edge switch configuration,<sup>8</sup> the core-edge switch configuration configured to receive frames at an edge switch,<sup>9</sup> route the frames to a core switch,<sup>10</sup> and then route the frames to an edge switch for transmission.<sup>11</sup> The method includes receiving at least one frame of the flow of frames at an edge switch of the core-edge switch configuration;<sup>12</sup> applying a process at one switch in the core-edge switch configuration to select a route through at least two switches forming the core-edge switch configuration<sup>13</sup> (for the at least one frame of the flow of frames<sup>14</sup>) to balance frame traffic through the core-edge switch

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<sup>4</sup> Specification of the subject Application as published (hereinafter “Specification”), p. 1, lines 1-7 of ¶ [0006].

<sup>5</sup> Specification, p. 1, lines 7-14 of ¶ [0006].

<sup>6</sup> Specification, p. 1, lines 1-4 of ¶ [0007].

<sup>7</sup> Specification, p. 1, lines 4-9 of ¶ [0007].

<sup>8</sup> Specification, p. 6, lines 1-2 of ¶ [0050]; *see also* Figure 5.

<sup>9</sup> Specification, p. 6, lines 2-5 of ¶ [0050]; *see also* Figure 5.

<sup>10</sup> Specification, p. 6, lines 5-9 of ¶ [0050]; *see also* Figure 5.

<sup>11</sup> Specification, p. 6, lines 9-14 of ¶ [0050]; *see also* Figure 5.

<sup>12</sup> Specification, p. 6, lines 1-5 of ¶ [0050]; *see also* Figure 5.

<sup>13</sup> Specification, p. 6, lines 5-11 of ¶ [0050]; *see also* Figure 5.

<sup>14</sup> Specification, p. 5, lines 1-6 of ¶ [0043].

configuration;<sup>15</sup> and transmitting the at least one frame from an edge switch of the core-edge switch configuration.<sup>16</sup>

In accordance with the invention of independent claim 33, for example, a switch fabric is described that includes at least a first switch and a second switch, the first and the second switch being communicatively coupled.<sup>17</sup> The first switch includes at least two core switches, at least two edge switches (coupled to the at least two core switches so that a flow of frames is from an edge switch to a core switch to an edge switch to develop a core-edge switch configuration),<sup>18</sup> and routing logic associated with a switch.<sup>19</sup> The routing logic selects a route through at least two switches that form the core-edge switch configuration<sup>20</sup> (for a frame of the flow of frames<sup>21</sup>) to balance the frame traffic through the core-edge switch configuration.<sup>22</sup>

In accordance with the invention of independent claim 65, for example, an apparatus is described that includes a switch.<sup>23</sup> The switch includes at least two core switches, at least two edge switches (coupled to the at least two core switches so that a flow of frames is from an edge switch to a core switch to an edge switch to develop a core-edge switch configuration),<sup>24</sup> and routing logic associated with a switch.<sup>25</sup> The routing logic selects a route through at least two switches forming the core-edge switch configuration<sup>26</sup> (for a frame of the flow of frames<sup>27</sup>) to balance frame traffic through the core-edge switch configuration.<sup>28</sup>

In accordance with the invention of independent claim 97, for example, a network is described that includes a host, a physical storage unit, and a first switch communicatively coupled to the host and the physical storage unit.<sup>29</sup> The first switch includes at least two core switches, at least two edge switches (coupled to the at least two core switches so that a flow of

<sup>15</sup> Specification, p. 5, lines 1-5 and 7-12 of ¶ [0049]; and p. 6, lines 1-5 of ¶ [0051]; *see also* Figure 5.

<sup>16</sup> Specification, p. 6, lines 11-14 of ¶ [0050]; *see also* Figure 5.

<sup>17</sup> Specification, p. 2, lines 1-8 of ¶ [0021]; *see also* Figure 1.

<sup>18</sup> Figure 5 and Specification, p. 5, lines 1-13 of ¶ [0047]; and Specification p. 6, lines 1-14 of ¶ [0050].

<sup>19</sup> Specification, p. 2, lines 1-10 of ¶ [0023]; *see also* Figure 2.

<sup>20</sup> Specification, p. 6, lines 5-11 of ¶ [0050]; *see also* Figure 5.

<sup>21</sup> Specification, p. 5, lines 1-6 of ¶ [0043].

<sup>22</sup> Specification, p. 5, lines 1-5 and 7-12 of ¶ [0049]; and p. 6, lines 1-5 of ¶ [0051]; *see also* Figure 5.

<sup>23</sup> Specification, p. 5, lines 1-13 of ¶ [0047]; *see also* Figure 5.

<sup>24</sup> Figure 5 and Specification, p. 5, lines 1-13 of ¶ [0047]; and Specification p. 6, lines 1-14 of ¶ [0050].

<sup>25</sup> Specification, p. 2, lines 1-10 of ¶ [0023]; *see also* Figure 2.

<sup>26</sup> Specification, p. 6, lines 5-11 of ¶ [0050]; *see also* Figure 5.

<sup>27</sup> Specification, p. 5, lines 1-6 of ¶ [0043].

<sup>28</sup> Specification, p. 5, lines 1-5 and 7-12 of ¶ [0049]; and p. 6, lines 1-5 of ¶ [0051]; *see also* Figure 5.

<sup>29</sup> Specification, p. 2, lines 5-13 of ¶ [0020] and lines 1-8 of ¶ [0021]; *see also* Figure 1.



frames is from an edge switch to a core switch to an edge switch to develop a core-edge switch configuration),<sup>30</sup> and routing logic associated with a switch.<sup>31</sup> The routing logic selects a route through at least two switches forming the core-edge switch configuration<sup>32</sup> (for a frame of the flow of frames<sup>33</sup>) to balance frame traffic through the core-edge switch configuration.<sup>34</sup>

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<sup>30</sup> Figure 5 and Specification, p. 5, lines 1-13 of ¶ [0047]; and Specification p. 6, lines 1-14 of ¶ [0050].

<sup>31</sup> Specification, p. 2, lines 1-10 of ¶ [0023]; *see also* Figure 2.

<sup>32</sup> Specification, p. 6, lines 5-11 of ¶ [0050]; *see also* Figure 5.

<sup>33</sup> Specification, p. 5, lines 1-6 of ¶ [0043].

<sup>34</sup> Specification, p. 5, lines 1-5 and 7-12 of ¶ [0049]; and p. 6, lines 1-5 of ¶ [0051]; *see also* Figure 5.

## VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

- Whether claims 1-3, 6, 19, 20, 29, 30, 32-35, 38, 51, 52, 61, 62, 64-67, 70, 83, 84,<sup>35</sup> 93-95, 97-99, 102, 114, 115, 124 and 125<sup>36</sup> are indefinite under 35 U.S.C. § 112, 2<sup>nd</sup> paragraph.
- Whether claims 1-3, 6, 19, 29, 30, 32-35, 38, 51, 52, 61, 62, 64-67, 70, 83,<sup>37</sup> 93-95, 97-99, 102, 114, 115, 124 and 125 are rendered obvious by Valdevit et al. (U.S. Pub. Pat. App. No. 2002/0156918; hereinafter, “Valdevit”) in view of Tech Note: Exploring Brocade ISL Trunking (pages 1-26, January 2002; hereinafter, “Tech Note”) under 35 U.S.C. § 103(a).

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<sup>35</sup> Appellants respectfully note that the Examiner listed claims “83-83” as rejected under § 112, 2<sup>nd</sup> paragraph, but in the body of the rejection referred to claims “83-84.” Appellants thus assume that claim 84 has been rejected under 35 U.S.C. § 112, 2<sup>nd</sup> paragraph, and at least for this reason have included the rejection of claim 84 in the list of rejections being appealed.

<sup>36</sup> Appellants respectfully note that although the Examiner included claims 97-99, 102, 114, 115, 124 and 125 in the list of claims rejected under 35 U.S.C. § 112, 2<sup>nd</sup> paragraph, the Examiner failed to provide a basis for the rejections of these claims in the body of rejection.

<sup>37</sup> Appellants respectfully note that the Examiner again listed claims “83-83” as rejected, this time under § 103(a), and did not reference claim 84 at all in the body of the rejection. Appellants thus assume that claim 84 does not stand rejected as obvious over the cited art under 35 U.S.C. § 103(a).

## VII. ARGUMENT

### A. Overview of Valdevit

Valdevit is directed to systems and methods for distributing traffic load through dynamic path selection in a communication network while guaranteeing in-order delivery of frames within a sequence.<sup>38</sup> Header information is used to categorize data frames, as each frame is received, into sequences that require in-order delivery.<sup>39</sup> Each sequence is associated with a path taken by all data frames within a given sequence to reach a given destination, thus preserving the order of the frames within each sequence.<sup>40</sup> Valdevit further teaches a Fibre Channel fabric as an example of at least part of the aforementioned communication network,<sup>41</sup> wherein the fabric includes one or more interconnected Fibre Channel switches.<sup>42</sup> Each switch uses a destination identifier included within received frames to make routing decisions, and includes routing tables that allow routes to be set up independently per receive port, or alternatively includes a centralized routing table structure.<sup>43</sup>

Valdevit further teaches a dynamic path selection that is implemented within the fabric switches, such that the internal path for data flow from each port within a switch is not “hard wired” but rather consists of a set of possible paths.<sup>44</sup> The switches taught by Valdevit, such as those shown in Figures 3A and 3B,<sup>45</sup> include a plurality of ports,<sup>46</sup> and routing logic that functions to determine which port a particular data frame should go.<sup>47</sup> Based on the multiple-field routing table and the entries established at initiation of the switch, the routing logic decides (for each frame) which path to take, and thus which port to use, causing the frame to be sent through the appropriate internal data path within the switch.<sup>48</sup> Appellants respectfully submit that nowhere within Valdevit is there a teaching or even a suggestion that the selected route is

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<sup>38</sup> Valdevit, pp. 1-2, lines 1-5 of ¶ [0012].

<sup>39</sup> Valdevit, p. 2, lines 5-8 of ¶ [0012].

<sup>40</sup> Valdevit, p. 2, lines 8-12 of ¶ [0012].

<sup>41</sup> Valdevit, p. 2, lines 1-4 of ¶ [0028]; and p. 3, lines 1-2 of ¶ [0039].

<sup>42</sup> Valdevit, p. 3, lines 1-6 of ¶ [0040] and Figure 2.

<sup>43</sup> Valdevit, p. 3, lines 29-35 of ¶ [0040].

<sup>44</sup> Valdevit, p. 4, lines 1-8 of ¶ [0049] and Figure 3B. Appellants respectfully note that Valdevit includes two figures labeled “3A,” and Appellants have assumed that Figure 3B, as referenced in Valdevit, refers to the second figure (on the bottom half of the page) labeled as Figure 3A.

<sup>45</sup> Valdevit, p. 5, lines 12-15 of ¶ [0051].

<sup>46</sup> Valdevit, p. 5, lines 1-12 of ¶ [0051] and Figure 4.

<sup>47</sup> Valdevit, p. 5, lines 9-10 of ¶ [0052] and Figure 4.

<sup>48</sup> Valdevit, p. 5, lines 16-22 of ¶ [0052] and Figure 4.

through two switches. Valdevit instead merely teaches that the route is directed out of the selected port of the single switch itself.

## **B. Overview of Tech Note**

Tech Note is directed to providing an in-depth examination of trunking and how trunking impacts the design, implementation and maintenance of a storage area network (SAN).<sup>49</sup> Tech Note teaches that “trunking” is a feature that enables traffic to be optimally shared across available inter-switch links (ISLs) while preserving in-order delivery.<sup>50</sup> Trunking uses a simple algorithm to optimally distribute frames across a set of available paths that link two adjacent switches, wherein the set of links is called a “trunking group.”<sup>51</sup> Each “trunking link” is analogous to an ISL, and consists of the two trunking ports (*i.e.*, ports that belong to a trunking group<sup>52</sup>), as well as the connecting components (*i.e.*, transceivers and interconnecting cables).<sup>53</sup> A trunk group logically joins a plurality of ISLs into one logical ISL,<sup>54</sup> wherein the plurality of physical ISLs are parallel links between the same pair of switches.<sup>55</sup> The distribution of frames (*i.e.*, routing) across a set of available ISLs taught by Tech Note is thus an internal operation within a single switch, wherein a frame is routed to a selected port within the switch. Appellants respectfully submit that nowhere within Tech Note is there a teaching or even a suggestion of a selection of a route through at least two switches.

## **C. The Indefiniteness Rejections of Claims 1-3, 6, 19, 20, 29, 30, 32-35, 38, 51, 52, 61, 62, 64-67, 70, 83, 84, 93-95, 97-99, 102, 114, 115, 124 and 125**

### **1. Claims 1-3, 6, 19, 20, 29, 30 and 32**

In rejecting claims 1-3, 6, 19, 20, 29, 30 and 32 as allegedly indefinite under 35 U.S.C. § 112, 2<sup>nd</sup> paragraph, the Examiner indicated that “the claims commonly recite the terms ‘an edge switch’ in numerous places, *i.e.*, lines 3, 5 and 12 and ‘one switch’ in line 7 of base claim 1.

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<sup>49</sup> Tech Note, p. 3, lines 1-2 of ¶ 1.

<sup>50</sup> Tech Note, p. 3, lines 1-2 of ¶ 2.

<sup>51</sup> Tech Note, p. 22, lines 1-3 of ¶ 4, and p. 23, Figure 17.

<sup>52</sup> Tech Note, p. 22, line 1 of ¶ 5, and p. 23, Figure 17.

<sup>53</sup> Tech Note, p. 22, lines 1-3 of ¶ 6, and p. 23, Figure 17.

<sup>54</sup> Tech Note, p. 3, lines 2-3 of ¶ 2.

<sup>55</sup> See Tech Note, p. 6, Figure 3; and p. 23, Figure 17.

It is unclear whether the term refers to the same element.”<sup>56</sup> Referring specifically to independent claim 1, Applicants respectfully traverse the Examiner’s rejection and respectfully submit that the scope of each term is clear when taken within the context of the claim as a whole, and when the claim is read in light of the specification. More specifically, the recitation of an edge switch, a core switch, and an edge switch describes a core-edge switch configuration, as would be understood by one of ordinary skill in the art. The claim is written with sufficient breadth to allow for multiple edge switches (both receiving and transmitting). There is no requirement that the receiving (ingress) and transmitting (egress) switches be the same switch. Indeed, in most usages two different edge switches would be used. The use of “the edge switch” at any of the occurrences cited by the Examiner (as suggested by the Examiner<sup>57</sup>), however, could imply that the referenced switch is the same switch as one previously recited in the claim, unduly limiting the claimed invention to less than what Appellants consider their invention to be.

Similarly, there is no requirement that the receiving and transmitting switches be different switches, and the use of “a first edge switch” and “a second edge switch” (as also suggested by the Examiner<sup>58</sup>) could imply that the referenced switches are different switches, again unduly limiting the claimed invention to less than what Appellants consider their invention to be. While it was noted above that two different edge switches would be the common usage, other cases could be developed where transiting the one switch is required. Thus, Appellants have used “an edge switch” to indicate the possibility that the operations required by claim 1 could occur in different switches or in the same switch, and one of ordinary skill in the art would understand such possibilities to be within the scope of both the embodiments described in the specification and independent claim 1.

Appellants further respectfully note, with regard to the definiteness requirement of §112, 2<sup>nd</sup> paragraph, that,

The essential inquiry pertaining to this requirement is whether the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity. Definiteness of claim language must be analyzed, not in a vacuum, but in light of:

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<sup>56</sup> Office Action, ¶ 3, p. 2.

<sup>57</sup> See Advisory Action dated April 1, 2008 (hereinafter “Advisory Action”), p. 2.

<sup>58</sup> See Advisory Action, p. 2.

- (A) The content of the particular application disclosure;
- (B) The teachings of the prior art; and
- (C) The claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made.

In reviewing a claim for compliance with 35 U.S.C. 112, second paragraph, the examiner must consider the claim as a whole to determine whether the claim apprises one of ordinary skill in the art of its scope and, therefore, serves the notice function required by 35 U.S.C. 112, second paragraph, by providing clear warning to others as to what constitutes infringement of the patent.<sup>59</sup>

Appellants respectfully submit that the analysis presented by the Examiner examines the claim terms piecemeal, fails to consider the claim as a whole, and fails to consider the interpretation that one of ordinary skill in the art would give the claim language when read in light of the specification. More specifically, Appellants respectfully submit that the term “an edge switch” was not considered by the Examiner within the context of the core-edge switch configuration required by the claim and described and illustrated in detail in the specification. One of ordinary skill in the art would recognize that a core-edge switch configuration, by its very nature, allows for the possibility that the required/recited operations could be applied to different edge switches or the same edge switch.

Appellants further respectfully submit that the use of the term “one switch” makes it clear that the process required by the claim is not limited to being applied only at an edge switch or at the core switch. More specifically, the claim element requires selecting a route through at least two switches, a condition that can be met by the first edge switch in the edge-core switch configuration or by the core switch. Because either switch could meet the claim requirements, Appellants again respectfully submit that the use of terms such as “the edge switch” or “the core switch” would unduly limit the claimed invention to less than what Appellants consider their invention to be. While the term “one switch” is broad, the term is clearly limited to one of the switches required by the claim (a well-defined and bounded set), and is thus not indefinite.<sup>60</sup>

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<sup>59</sup> MPEP § 2173.02 (citing *Solomon v. Kimberly-Clark Corp.*, 216 F.3d 1372, 1379, 55 USPQ2d 1279, 1283 (Fed. Cir. 200), and *In re Larsen*, No. 01-1092 (Fed. Cir. May 9, 2001) (unpublished)) (emphasis added).

<sup>60</sup> See MPEP § 2173.04 (“Breadth of a claim is not to be equated with indefiniteness. *In re Miller*, 441 F.2d 689, 169 USPQ 597 (CCPA 1971). If the scope of the subject matter embraced by the claims is clear, and if Appellants have not otherwise indicated that they intend the invention to be of a scope different from that defined in the claims, then the claims comply with 35 U.S.C. 112, second paragraph.”).

Appellants respectfully note that all that is required is that the claims “define the patentable subject matter with a reasonable degree of particularity and distinctness,”<sup>61</sup> and further that “[s]ome latitude in the manner of expression and the aptness of terms should be permitted even though the claim language is not as precise as the examiner might desire.”<sup>62</sup>

Appellants additionally respectfully submit that the use of the term “a switch” in claim 29 (which depends upon independent claim 1) is also not indefinite for at least the same reasons as those presented with regard to the term “one switch,” since either a first edge switch or a core switch could add the tag, with a core switch or a second edge switch then using the tag information. The use of “a switch” properly avoids limiting the claim to a single switch.

For at least these reasons, Appellants respectfully submit that the scope of the terms used within the rejected claims (and thus of the claims as a whole) is clear, that the public is informed of the boundaries of what would constitute infringement of the claimed invention, and that a clear measure of what Appellants regard as their invention has been provided.<sup>63</sup> Indeed, the file wrapper of this case now very clearly provides these boundaries based on the arguments that Appellants have provided in this Appeal Brief and in the prior Response. Appellants therefore respectfully submit that the Examiner erred in rejecting claims 1-3, 6, 19, 20, 29, 30 and 32 as indefinite under 35 U.S.C. § 112, 2<sup>nd</sup> paragraph, and respectfully request the reversal of the Examiner’s indefiniteness rejections of these claims.

## **2. Claims 33-35, 38, 51, 52, 61, 62 and 64**

In rejecting claims 33-35, 38, 51, 52, 61, 62 and 64 as allegedly indefinite under 35 U.S.C. § 112, 2<sup>nd</sup> paragraph, the Examiner indicated that “the claims commonly recite the terms ‘an edge switch’ twice on line 6 and ‘a switch’ on line 2 and 8 of base claim 33. It is unclear whether the terms refer to the same element.”<sup>64</sup> For at least the same reasons as those presented above with regard to independent claim 1, Appellants respectfully submit that the scope of each of claims 33-35, 38, 51, 52, 61, 62 and 64 is clear, and that the claims thus do particularly point out and distinctly claim the inventions to which they are respectively directed, as required by the

<sup>61</sup> MPEP § 2173.02 (emphasis in original).

<sup>62</sup> MPEP § 2173.02 (emphasis added).

<sup>63</sup> See MPEP § 2173.

<sup>64</sup> Office Action, ¶ 3, p. 3.

statute. Appellants therefore respectfully submit that the Examiner erred in rejecting claims 33-35, 38, 51, 52, 61, 62 and 64 as indefinite under 35 U.S.C. § 112, 2<sup>nd</sup> paragraph, and respectfully request the reversal of the Examiner's indefiniteness rejections of these claims.

### **3. Claims 65-67, 70, 83, 84 and 93-95**

In rejecting claims 65-67, 70, 83, 84 and 93-95 as allegedly indefinite under 35 U.S.C. § 112, 2<sup>nd</sup> paragraph, the Examiner indicated that "the claims commonly recite the terms 'an edge switch' twice on line 8; 'a switch' on line 2, and 'two switches' on line 11 of base claim 65. It is unclear whether the terms refer to the same element."<sup>65</sup> For at least reasons similar to those presented above with regard to independent claim 1, Appellants respectfully submit that scope of the terms "an edge switch" and "a switch" is sufficiently clear to meet the statutory requirements of § 112, 2<sup>nd</sup> paragraph.

Further, with regard to the term "two switches," Appellants respectfully note that this language is being used to specify that the routing logic selects a route through at least two switches in the core-edge switch configuration. As previously defined, the frame flow is edge switch to core switch to edge switch. Therefore there are three cases where "at least two switches" are available for the routing, namely (1) first edge switch to core switch, (2) core switch to second edge switch or (3) first edge switch to core switch to second edge switch. The use of the term "two switches," without specifying particular combinations, allows the three possibilities to be efficiently specified, and the term is clearly limited to two of the switches required by the claim (a well-defined and bounded set). Appellants thus respectfully submit that the term is not indefinite.

For at least these reasons, Appellants respectfully submit that the scope of all the claim terms of claims 65-67, 70, 83, 84 and 93-95, and thus of each of the claims, is sufficiently clear to meet the statutory requirements of § 112, 2<sup>nd</sup> paragraph. Appellants therefore respectfully submit that the Examiner erred in rejecting claims 65-67, 70, 83, 84 and 93-95 as indefinite under 35 U.S.C. § 112, 2<sup>nd</sup> paragraph, and respectfully request the reversal of the Examiner's indefiniteness rejections of these claims.

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<sup>65</sup> Office Action, ¶ 3, p. 3.



#### **4. Claims 97-99, 102, 114, 115, 124 and 125**

Appellants respectfully note that although claims 97-99, 102, 114, 115, 124 and 125 were included in the list of claims rejected as allegedly indefinite under 35 U.S.C. § 112, 2<sup>nd</sup> paragraph, the Examiner failed to provide a basis for the rejections of these claims in the body of the rejections. Appellants thus respectfully submit that claims 97-99, 102, 114, 115, 124 and 125 do not stand properly rejected.<sup>66</sup> Nonetheless, Appellants respectfully submit that at least for reasons similar to those presented above with regard to independent claims 1, 33 and 65 (as well with regard to those claims that respectively depend upon them), claims 97-99, 102, 114, 115, 124 and 125 also meet the statutory requirements of § 112, 2<sup>nd</sup> paragraph. At least for all of these reasons, Appellants respectfully submit that the Examiner erred in rejecting claims 97-99, 102, 114, 115, 124 and 125 as indefinite under 35 U.S.C. § 112, 2<sup>nd</sup> paragraph, and thus respectfully request the reversal of the Examiner's indefiniteness rejections of these claims.

#### **D. The Obviousness Rejections of Claims 1-3, 6, 19, 29, 30, 32-35, 38, 51, 52, 61, 62, 64-67, 70, 83, 93-95, 97-99, 102, 114, 115, 124 and 125**

##### **1. Independent Claim 1**

The Examiner rejected independent claim 1 under 35 U.S.C. § 103(a) as allegedly obvious over Valdevit<sup>67</sup> in view of Tech Note. While acknowledging that "[i]t appears that Valdevit may not explicitly teach '*to select a route through at least two switches forming the [core]-edge switch configuration*',"<sup>68</sup> the Examiner subsequently states that "such limitation

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<sup>66</sup> See 35 U.S.C. § 132(a) ("Whenever, on examination, any claim for a patent is rejected, or any objection or requirement made, the Director shall notify the Appellant thereof, stating the reasons for such rejection, or objection or requirement, together with such information and references as may be useful in judging of the propriety of continuing the prosecution of his application...") (emphasis added); 37 CFR 104(b) ("The examiner's action will be complete as to all matters, except that in appropriate circumstances, such as misjoinder of invention, fundamental defects in the application, and the like, the action of the examiner may be limited to such matters before further action is made.") (emphasis added); and MPEP § 706 ("The goal of examination is to clearly articulate any rejection early in the prosecution process so that the Appellant has the opportunity to provide evidence of patentability and otherwise reply completely at the earliest opportunity.") (emphasis added).

<sup>67</sup> Appellants note that technically Valdevit is not properly a reference under §103 as the conditions of § 103(c) apply, but respond in a conservative fashion as one of the embodiments disclosed in Valdevit may have been on sale or in public use under § 102(b) more than one year before the priority date of the subject Application.

<sup>68</sup> Office Action, ¶ 4, p. 4 (italics in original).

lacks thereof from Valdevit reference is well known and taught by the Tech Note.”<sup>69</sup> More specifically, the Examiner stated that,

In an analogous art, the Tech Note teach inter-switch link (ISL) trunking (see Tech Note; page 3, Introduction), comprising, among other things, the limitation of “*to select a route through at least two switches forming the code[sic]-edge switch configuration*” (Tech Note; page 23, Fig. 17 and Trunking Group discussed on page 22 to include using “*a simple algorithm to optimally distribute frames across a set of available paths that link two adjacent switches*”) to enable traffic to be optimally shared across available ISLs while preserving in-order delivery (Tech Note; page 3, Introduction).<sup>70</sup>

Appellants respectfully traverse the Examiner’s characterization of the Tech Note reference, and respectfully submit that neither the Valdevit nor Tech Note references teach or even suggest “applying a process at one switch in the core-edge switch configuration to select a route through at least two switches,” as required by independent claim 1.

Appellants respectfully submit that the text cited from Tech Note has been misinterpreted. As already noted in the Overview of Tech Note presented above, Tech Note teaches parallel inter-switch links that each couple together the same pair of switches, and which together form a trunk group.<sup>71</sup> Each trunk group logically joins a plurality of ISLs into one logical ISL.<sup>72</sup> To clarify this point further, Appellants respectfully note that the full text of the definition of the Term “Trunking Group” from the “Terms and Definitions” page of Tech Note reads,

**Trunking Group:** Trunking uses a simple algorithm to optimally distribute frames across a set of available paths that link two adjacent switches. Such a set of links is called trunking group (see Figure 17). It is possible to have two trunk groups per quad. This means having two 2-isl trunks, with each trunk connected to a different switch.<sup>73</sup>

As can be seen in Figure 17 of Tech Note, the core1 switch is linked to the edge6 switch using a 4-ISL trunking group (designated in the legend of Figure 17 as a “4 ISL Trunk”), and the core1 switch is further linked to the edge7 switch using a separate 3-ISL trunking group (described in

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<sup>69</sup> Office Action, ¶ 4, p. 4.

<sup>70</sup> Office Action, ¶ 4, pp. 4-5 (italics in original).

<sup>71</sup> See Tech Note, p. 6, Figure 3; and p. 23, Figure 17.

<sup>72</sup> Tech Note, p. 3, lines 2-3 of ¶ 2.

<sup>73</sup> Tech Note, p. 22, lines 1-4 of ¶ 4 (emphasis added).

the legend of Figure 17 as a “3-ISL Trunk”). Each trunking group of the core1 switch is shown in the listing below Figure 17, with the 3-ISL trunking group including ports 8-10 of the core1 switch, and the 4-ISL trunking group including ports 12-15 of the core1 switch. Thus, the distribution of frames according to the trunking algorithm across ISLs within a trunking group results in the routing of the frames to the same, single switch. For example, ports 8-10 of the core1 switch each provides access to one of the three parallel inter-switch links that form the 3-ISL trunking group, each ISL linking the two adjacent switches core1 and edge7. When a frame is routed, the route is through the same, single switch, and not the “at least two switches” required by independent claim 1, regardless of which of ports 8, 9 or 10 is selected by the trunking algorithm for transmission and forwarding of the frame.<sup>74</sup>

Appellants further respectfully note that in the Advisory Action the Examiner stated that the preamble of claim 1 is understood as “‘The frames [are] received at an edge switch, route them to a core switch, the[n] route them out from the same edge switch,’ because of there is no clear language in the claim to say whethe[r] ‘an edge switch’ is the same one or a different ‘edge switch’ as subsequently recited.”<sup>75</sup> Appellants respectfully submit that it is irrelevant whether the frame is routed through the same edge switch or a different edge switch from the core switch. In each case the frame is routed through at least two switches, *i.e.*, at least an edge switch and the core switch. As already noted, the cited art is directed solely to the routing of frames within a single switch, and thus none of the cited art teaches or even suggests selecting a route through at least two switches.

For at least these reasons, Appellants respectfully submit that neither Valdevit nor Tech Note teach or even suggest “applying a process at one switch in the core-edge switch configuration to select a route through at least two switches,” as required by independent claim 1, and thus do not teach or suggest, either alone or together, all of the limitations of the claim. Appellants therefore respectfully submit that independent claim 1 is not rendered obvious by the cited art under 35 U.S.C. § 103(a), respectfully submit that the Examiner erred in rejecting the

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<sup>74</sup> For a further explanation of trunking, see U.S. Patent Application Serial No. 09/872,412, entitled “Linking Trunking and Measuring Link Latency,” which is incorporated by reference in the subject Application.

<sup>75</sup> Advisory Action, p. 2.

claim as obvious over the cited art, and respectfully request reversal of the Examiner's rejection of independent claim 1 under 35 U.S.C. § 103(a).

## **2. Dependent Claims 2, 3, 6, 19, 29 30 and 32**

Because dependent claims 2, 3, 6, 19, 29, 30 and 32 each depend upon independent claim 1, and thus include all of the limitations of claim 1, Appellants respectfully submit that for at least the same reasons as those presented with regard to independent claim 1, dependent claims 2, 3, 6, 19, 29, 30 and 32 are also not rendered obvious by the cited art. Appellants thus respectfully submit that the Examiner erred in rejecting these claims under 35 U.S.C. § 103(a), and respectfully request reversal of the Examiner's rejections of dependent claims 2, 3, 6, 19, 29, 30 and 32.

Appellants additionally respectfully note that in rejecting dependent claims 29 and 30 as obvious over Valdevit in view of Tech Note, the Examiner cited paragraph [0063] of Valdevit as supporting the rejecting, stating that "*Source and destination tags are discussed at paragraph [0063] and thereafter of the Valdevit,*" and that "*Adding and removing source and destination tags are discussed at paragraph [0063] and thereafter of the Valdevit.*"<sup>76</sup> Appellants respectfully traverse the Examiner's characterization of the cited art, noting that although paragraph [0063] mentions destination identifier D\_ID and source identifier S\_ID, these are the source and destination addresses contained in the frames. They are not tags added to the frames and then stripped from the frames. Indeed, stripping the source and destination addresses would render the frames unroutable at the next switch. Appellants thus respectfully submit that the S\_ID and D\_ID clearly do not correspond to the source and/or destination tags required by both claim 29 and claim 30.

For at least these reasons, and in addition to the reasons presented above with regard to independent claim 1 (upon which claims 29 and 30 depend), neither Valdevit and Tech Note, either alone or together, teach or even suggest all of the limitations of either dependent claim 29 or dependent claim 30, and thus do not render the claims obvious under 35 U.S.C. § 103(a). Appellants therefore again respectfully submit that the Examiner erred in rejecting these claims,

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<sup>76</sup> Office Action, ¶ 4, p. 6 (italics in original).

and again respectfully request reversal of the Examiner obviousness rejections of dependent claims 29 and 30.

### **3. Independent Claims 33, 65 and 97**

Appellants respectfully note that independent claims 33, 65 and 97 include limitations similar to those of independent claim 1, and were all rejected under the same rationale as independent claim 1.<sup>77</sup> Appellants thus respectfully submit that claims 33, 65 and 97 are not rendered obvious by the cited art for at least the same reasons as those presented with regard to independent claim 1. Appellants therefore respectfully submit that the Examiner erred in rejecting independent claims 33, 65 and 97, and respectfully request reversal of the Examiner's obviousness rejections of these claims.

### **4. Dependent Claims 34, 35, 38, 51, 52, 61, 62, 64, 66, 67, 70, 83, 93-95, 98, 99, 102, 114, 115, 124 and 125**

Appellants respectfully note that dependent claims 34, 35, 38, 51, 52, 61, 62, 64, 66, 67, 70, 83, 93-95, 98, 99, 102, 114, 115, 124 and 125 include limitations similar to those of dependent claims 2, 3, 6, 19, 20, 29, 30 and 32, and were all rejected under the same rationale as the respectively corresponding dependent claims.<sup>78</sup> Appellants thus respectfully submit that claims 34, 35, 38, 51, 52, 61, 62, 64, 66, 67, 70, 83, 93-95, 98, 99, 102, 114, 115, 124 and 125 are not rendered obvious by the cited art for at least the same reasons as those presented with regard to respectively corresponding dependent claims 2, 3, 6, 19, 20, 29, 30 and 32. Appellants therefore respectfully submit that the Examiner erred in rejecting dependent claims 34, 35, 38, 51, 52, 61, 62, 64, 66, 67, 70, 83, 93-95, 98, 99, 102, 114, 115, 124 and 125, and respectfully request reversal of the Examiner's obviousness rejections of these claims.

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<sup>77</sup> See individual rejections of each claim, ¶ 4, pp. 7-8, 10-11 and 13-14; *see also* notes by the Examiner, ¶ 4, pp. 7 and 10 (expressly indicating that the rejections are based on the same rationale).

<sup>78</sup> See individual rejections of each claim, ¶ 4, pp. 8-10, 11-13 and 14-15; *see also* notes by the Examiner, ¶ 4, pp. 7 and 10 (expressly indicating that the rejections are based on the same rationale).

**E. Conclusion**

For the reasons stated above, Appellants respectfully submit that the Examiner erred in rejecting claims 1-3, 6, 19, 20, 29, 30, 32-35, 38, 51, 52, 61, 62, 64-67, 70, 83, 84, 93-95, 97-99, 102, 114, 115, 124 and 125, and respectfully request reversal of the rejections of these claims. Appellants believe that no extensions of time or fees are required, beyond those that may otherwise be provided in documents accompanying this response. Nonetheless, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fees required (including fees for net addition of claims) are hereby authorized to be charged to Wong Cabello's Deposit Account No. 50-1922.

Respectfully submitted,

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*Filed Electronically*

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### **VIII. CLAIMS APPENDIX**

1. (Previously Presented) A method of routing a flow of frames for a core-edge switch configuration, the core-edge switch configuration configured to receive frames at an edge switch, route the frames to a core switch and then route the frames to an edge switch for transmission, the method comprising:

receiving at least one frame of the flow of frames at an edge switch of the core-edge switch configuration;

applying a process at one switch in the core-edge switch configuration to select a route through at least two switches forming the core-edge switch configuration for said at least one frame of the flow of frames to balance frame traffic through the core-edge switch configuration; and

transmitting said at least one frame from an edge switch of the core-edge switch configuration.

2. (Original) The method of claim 1, wherein said process comprises a pseudo-random process.

3. (Original) The method of claim 2, wherein applying said pseudo-random process comprises applying a hash function.

4.-5. (Cancelled)

6. (Previously Presented) The method of claim 3, wherein said hash function is applied to possible routes through the core-edge switch configuration to balance the flow of frames through the core-edge switch configuration to an external exit port of the core-edge switch configuration.

7.-18. (Cancelled)

19. (Previously Presented) The method of claim 1, wherein said process comprises applying weights

20. (Previously Presented) The method of claim 19, wherein said weights are applied to possible routes through the core-edge switch configuration to balance the flow of frames through the core-edge switch configuration to an external port of the core-edge switch configuration.

21.-28. (Cancelled)

29. (Previously Presented) The method of claim 1, wherein said route is selected based at least in part on a source tag and/or a destination tag added to said frame after said frame enters a switch of the core-edge switch configuration.

30. (Previously Presented) The method of claim 29, wherein said source tag and/or said destination tag is stripped off said frame before said frame exits the core-edge switch configuration.

31. (Cancelled)

32. (Previously Presented) The method of claim 1, wherein said switches of said configuration comprise Fibre Channel compliant switches.



33. (Previously Presented) A switch fabric comprising:  
at least a first switch and a second switch, said first and said second switch being communicatively coupled;  
said first switch including:  
at least two core switches;  
at least two edge switches coupled to said at least two core switches so that a flow of frames is from an edge switch to a core switch to an edge switch to develop a core-edge switch configuration; and  
routing logic associated with a switch which selects a route through at least two switches forming said core-edge switch configuration for a frame of said flow of frames to balance the frame traffic through said core-edge switch configuration.

34. (Previously Presented) The switch fabric of claim 33, wherein said routing logic pseudo-randomly selects a route for said frame of said flow of frames.

35. (Previously Presented) The switch fabric of claim 34, wherein said routing logic pseudo-randomly selects said route by applying a hash function.

36.-37. (Cancelled)

38. (Previously Presented) The switch fabric of claim 35, wherein said routing logic applies said hash function to possible routes through said core-edge switch configuration to balance the flow of frames through said core-edge switch configuration to an external exit port of said core-edge switch configuration.

39.-50. (Cancelled)

51. (Previously Presented) The switch fabric of claim 33, wherein said routing logic applies weights to select said route .

52. (Previously Presented) The switch fabric of claim 51, wherein said weights are applied to possible routes through said core-edge switch configuration to balance the flow of frames through said core-edge switch configuration to an external port of said core-edge switch configuration.

53.-60. (Cancelled)

61. (Previously Presented) The switch fabric of claim 33, wherein said routing logic selects said route based at least in part on a source tag and/or a destination tag added to said frame after said frame enters a switch of said core-edge switch configuration.

62. (Previously Presented) The switch fabric of claim 61, wherein one of said core or edge switches strips said source tag and/or said destination tag off said frame before said frame exits said core-edge switch configuration.

63. (Cancelled)

64. (Previously Presented) The switch fabric of claim 33, wherein said first and second switches comprise a Fibre Channel compliant switches.

65. (Previously Presented) An apparatus comprising:  
a switch, said switch including:  
    at least two core switches;  
    at least two edge switches coupled to said at least two core switches so that a flow of frames is from an edge switch to a core switch to an edge switch to develop a core-edge switch configuration; and  
    routing logic associated with a switch which selects a route through at least two switches forming said core-edge switch configuration for a frame of said flow of frames to balance frame traffic through said core-edge switch configuration.

66. (Previously Presented) The apparatus of claim 65, wherein said routing logic pseudo-randomly selects a route for said frame of said flow of frames.

67. (Previously Presented) The apparatus of claim 66, wherein said routing logic pseudo-randomly selects said route by applying a hash function.

68.-69. (Cancelled)

70. (Previously Presented) The apparatus of claim 67, wherein said routing logic applies said hash function to possible routes through said core-edge switch configuration to balance the flow of frames through said core-edge switch configuration to an external exit port of said core-edge switch configuration.

71.-82. (Cancelled)

83. (Previously Presented) The apparatus of claim 65, wherein said routing logic applies weights to select said route.

84. (Previously Presented) The apparatus of claim 83, wherein said weights are applied to possible routes through said core-edge switch configuration to balance the flow of frames through said core-edge switch configuration to an external port of said core-edge switch configuration.

85.-92. (Cancelled)

93. (Previously Presented) The apparatus of claim 65, wherein said routing logic selects said route based at least in part on a source tag and/or a destination tag added to said frame after said frame enters a switch of said core-edge switch configuration.

94. (Previously Presented) The apparatus of claim 93, wherein one of said core or edge switches strips said source tag and/or said destination tag off said frame before said frame exits said core-edge switch configuration.

95. (Previously Presented) The apparatus of claim 65, wherein said switch comprises a Fibre Channel compliant switch.

96. (Cancelled)

97. (Previously Presented) A network comprising:  
a host;  
a physical storage unit; and  
a first switch communicatively coupled to said host and said physical storage unit;  
said first switch including:  
at least two core switches;  
at least two edge switches coupled to said at least two core switches so that a flow of frames is from an edge switch to a core switch to an edge switch to develop a core-edge switch configuration; and  
routing logic associated with a switch which selects a route through at least two switches forming said core-edge switch configuration for a frame of said flow of frames to balance frame traffic through said core-edge switch configuration.

98. (Previously Presented) The network of claim 97, wherein said routing logic pseudo-randomly selects said route for said frame of said flow of frames.

99. (Previously Presented) The network of claim 98, wherein said routing logic pseudo-randomly selects said route by applying a hash function.

100.-101. (Cancelled)

102. (Previously Presented) The network of claim 99, wherein said routing logic applies said hash function to possible routes through said core-edge switch configuration to balance the flow of frames through said core-edge switch configuration to an external exit port of said core-edge switch configuration.

103.-113. (Cancelled)

114. (Previously Presented) The network of claim 97, wherein said routing logic applies weights to select said route.

115. (Previously Presented) The network of claim 114, wherein said weights are applied to possible routes through said core-edge switch configuration to balance the flow of frames through said core-edge switch configuration to an external port of said core-edge switch configuration.

116.-123. (Cancelled)

124. (Previously Presented) The network of claim 97, wherein said routing logic selects said route based at least in part on a source tag and/or a destination tag added to said frame after said frame enters a switch of said core-edge switch configuration.

125. (Previously Presented) The network of claim 97, wherein one of said core or edge switches strips said source tag and/or said destination tag off said frame before said frame exits said core-edge switch configuration.

126.-157. (Cancelled)

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**IX. EVIDENCE APPENDIX**

None.

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**X. RELATED PROCEEDINGS APPENDIX**

None.